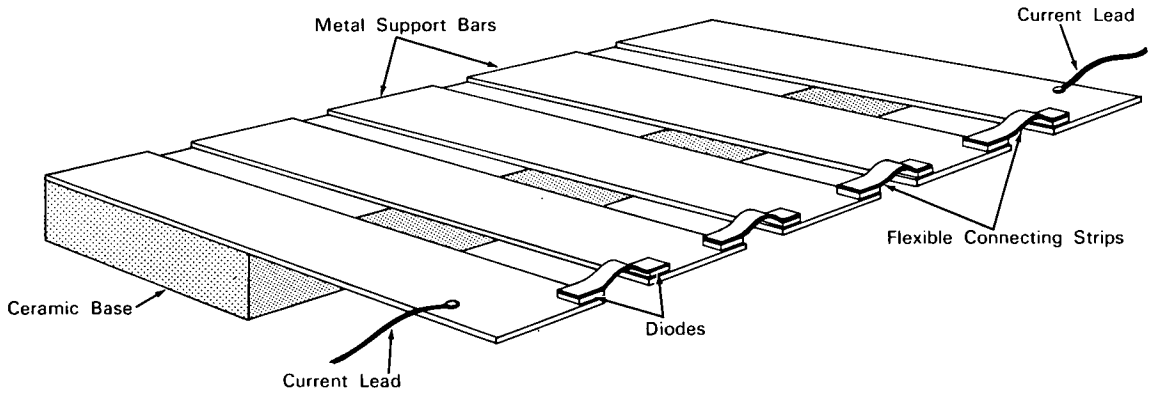
NASA TECH BRIEF

This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

Mounting for Diodes Provides Efficient Heat Sink



The problem: Mounting series-connected injection-luminescent diodes for efficient cooling. These diodes, which are used for pumping lasers, generate large amounts of heat (mainly because of contact resistance) when large driving currents are used. For efficient operation of the diodes, the heat must be rapidly dissipated.

The solution: The diodes are mounted on rigid metal bars which serve as heat sinks. These bars, which are good electrical and thermal conductors, are supported on a glass or ceramic insulating base.

How it's done: The diodes are soldered or brazed in proper polarity to the corners of the metal support bars. Electrical connections between diodes on adjacent bars are made by flexible metal strips which aid in heat dissipation but do not transmit appreciable forces between the diodes.

The metal bars may be embedded in a glass rod or brazed onto a ceramic base which has been metallized in the areas to be brazed. Satisfactory results were obtained when copper bars were brazed to the metallized areas on a ceramic base and the diodes were soldered to the bars with indium solder. Thin copper connecting strips, crimped to provide flexibility, were attached with indium solder to the diodes.

Notes:

1. Metal bars can be brazed to both sides of the ceramic base to accommodate more diodes.
2. A related innovation is described in NASA Tech Brief B63-10033, April 1964. Inquiries may also be directed to:

   Technology Utilization Officer
   Marshall Space Flight Center
   Huntsville, Alabama, 35812
   Reference: B64-10283

Patent status: NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA Headquarters, Washington, D.C., 20546.

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